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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/749,184

12/30/2003

Evan R. Green

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INTEL CORPORATION

c/o CPA Global

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EXAMINER

PHAN, HANH

ART UNIT

PAPER NUMBER

2613

NOTIFICATION DATE

DELIVERY MODE

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ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/749,184	<b>Applicant(s)</b> GREEN ET AL.
	<b>Examiner</b> HANH PHAN	<b>Art Unit</b> 2613

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Double Patenting***

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-9 and 19-25 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-12 of copending Application No. 12/976,099 (Green et al). Although the conflicting claims are not identical, they are not patentably distinct from each other because the limitations recited in claims 1-9 and 19-25 of the instant application are encompassed by claims 1-12 of copending Application 12/976,099 (Green et al).

Instant Application No. 10/749,184 (Claims 1 and 19)	Copending Application No. 12/976,099 (Claims 1-7)
A method comprising: receiving a broadband radio signal having a plurality of modulation frequencies;	A method comprising: receiving a broadband radio signal having a plurality of modulation frequencies (i.e., see claims 1-7);
amplifying the broadband radio signal to drive a laser source to produce an optical signal having a plurality of spectral components;	amplifying the broadband radio signal to drive a laser source to produce an optical signal having a plurality of spectral components (i.e., see claims 1-7);
optically transforming the optical signal to separate the plurality of spectral components into a plurality of	optically transforming the optical signal to separate the plurality of spectral components into a plurality of

corresponding photo-detectors; and	corresponding photo-detectors (i.e., see claims 1-7); and
converting the plurality of spectral components into a plurality of separate electronic signals corresponding to the plurality of modulation frequencies.	converting the plurality of spectral components into a plurality of separate electronic signals corresponding to the plurality of modulation frequencies (i.e., see claims 1-7).

Regarding claims 2 and 20, as similarly described above, Green et al discloses wherein optically transforming the optical signal is accomplished by transmitting the optical signal through a diffraction grating (i.e., see claims 1-12 of copending Application No. 12/976,099).

Regarding claims 3 and 21, as similarly described above, Green et al discloses wherein optically transforming the optical signal is accomplished by reflecting the optical signal off a diffraction grating (i.e., see claims 1-12 of copending Application No. 12/976,099).

Regarding claims 4, 5, 22 and 23, as similarly described above, Green et al discloses wherein said laser source is a vertical cavity surface emitting (VCSEL) laser or edge emitting (i.e., see claims 1-12 of copending Application No. 12/976,099).

Regarding claims 6 and 24, as similarly described above, Green et al discloses further comprising: demapping said separate electronic signals corresponding to the

plurality of modulation frequencies (i.e., see claims 1-12 of copending Application No. 12/976,099).

Regarding claims 7 and 24, as similarly described above, Green et al discloses further comprising: deinterleaving said separate electronic signals corresponding to the plurality of modulation frequencies (i.e., see claims 1-12 of copending Application No. 12/976,099).

Regarding claims 8, as similarly described above, Green et al discloses wherein the broadband radio signal is an ultra wideband radio signal (i.e., see claims 1-12 of copending Application No. 12/976,099).

Regarding claims 9 and 25, as similarly described above, Green et al discloses further comprising Fourier transforming the optical signal to separate the plurality of spectral components (i.e., see claims 1-12 of copending Application No. 12/976,099).

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 8, 10 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Tiemann et al (US Patent No. 7,085,497).

Regarding claim 1, referring to Figure 4a, Tiemann et al teaches a method comprising:

receiving (i.e., antenna 12a, Fig. 4a) a broadband radio signal (i.e., UHF signal, VHF signal and L-band signal, Fig. 4a) having a plurality of modulation frequencies;

amplifying (i.e., low-noise amplifier 462, Fig. 4a) the broadband radio signal to drive a laser source (i.e., RF-to- $\lambda$ 6 converter 450, RF-to- $\lambda$ 5 converter 452, RF-to- $\lambda$ 4 converter 454, and optical multiplexer 448, Fig. 4a), to produce an optical signal having a plurality of spectral components;

optically transforming (i.e., optical demultiplexer 446, Fig. 4a) the optical signal to separate the plurality of spectral components into a plurality of corresponding photo-detectors (i.e., light-to-RF converter 440, light-to-RF converter 442, and light-to-RF converter 444, Fig. 4a); and

converting (i.e., light-to-RF converter 440, light-to-RF converter 442, and light-to-RF converter 444, Fig. 4a) the plurality of spectral components into a plurality of separate electronic signals corresponding to the plurality of modulation frequencies (i.e., Figure 4a, col. 13, lines 60-67, col. 14, lines 1-67 and col. 15, lines 1-26).

Regarding claims 8 and 17, Tiemann et al further teaches wherein the broadband radio signal is an ultra wideband radio signal (i.e., Fig. 4a).

Regarding claim 10, referring to Figure 4a, Tiemann et al teaches a method comprising:

driving (i.e., RF-to- $\lambda$ 1 converter 410, RF-to- $\lambda$ 1 converter 412, RF-to- $\lambda$ 1 converter 414, Fig. 4a) a plurality of laser emitters from a plurality of electronic signals of a

Art Unit: 2613

plurality of modulation frequencies (i.e., UHF signal, VHF signal and L-band signal, Fig. 4a) to produce a plurality of optical signals of a plurality of spectral components;

optically inverse transforming (i.e., optical multiplexer 416, Fig. 4a) the plurality of optical signals into a composite optical signal including the plurality of spectral components;

converting (i.e., light-to-RF converter 420, light-to-RF converter 422, and light-to-RF converter 424, Fig. 4a) the composite optical signal including the plurality of spectral components into a composite electronic signal including the plurality of modulation frequencies; and

amplifying (i.e., amplifiers 426, 428 and 430, Fig. 4a) the composite electronic signal including the plurality of modulation frequencies for transmission as an ultra wideband radio signal (i.e., Figures 4a, col. 13, lines 60-67, col. 14, lines 1-67 and col. 15, lines 1-26).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.



6. Claims 2-7, 9, 11-15 and 18-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tiemann et al (US Patent No. 7,085,497) in view of Wickham et al (US Patent No. 6,094,285).

Regarding claims 2, 11, 19, 20, 26 and 33, Tiemann et al differs from claims 2, 11, 19, 20, 26 and 33 in that he fails to specifically teach a diffraction grating . However, Wickham et al teaches a diffraction grating (i.e., Figure 2, col. 3, lines 30-51). Based on this teaching, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the diffraction grating as taught by Wickham et al in the system of Tiemann et al. One of ordinary skill in the art would have been motivated to do this since allowing separating the multiplexed optical signal into the individual signals and reducing the error signal and increasing the signal to noise ratio.

Regarding claims 3, 12, 21, 27, 28, 34 and 35, the combination of Tiemann et al and Wickham et al teaches wherein optically transforming the optical signal is accomplished by reflecting the optical signal off a diffraction grating (i.e., Fig. 2 of Wickham et al).

Regarding claims 4, 5, 13, 14, 22, 23, 29, 30, and 36-39, the combination of Tiemann et al and Wickham et al teaches wherein said laser source is a vertical cavity surface emitting (VCSEL) laser or edge emitting (i.e., Fig. 4a of Tiemann et al and Fig. 2 of Wickham et al).

Regarding claims 6 and 24, the combination of Tiemann et al and Wickham et al teaches further comprising: demapping said separate electronic signals corresponding

to the plurality of modulation frequencies (i.e., Fig. 4a of Tiemann et al and Fig. 2 of Wickham et al).

Regarding claims 7, 24, 31 and 40, the combination of Tiemann et al and Wickham et al teaches further comprising: deinterleaving said separate electronic signals corresponding to the plurality of modulation frequencies (i.e., Fig. 4a of Tiemann et al and Fig. 2 of Wickham et al).

Regarding claims 9, 18, 25, and 32, the combination of Tiemann et al and Wickham et al teaches further comprising Fourier transforming the optical signal to separate the plurality of spectral components (i.e., Fig. 2 of Wickham et al).

Regarding claim 15, the combination of Tiemann et al and Wickham et al further comprising: interleaving and mapping said plurality of electronic signals of the plurality of modulation frequencies (i.e., Fig. 4a of Tiemann et al and Fig. 2 of Wickham et al).

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tiemann et al (US Patent No. 7,085,497) in view of Wickham et al (US Patent No. 6,094,285).

Regarding claim 16, the combination of Tiemann et al and Wickham et al differs from claim 16 in that he fails to specifically teach symbol wave shaping and IQ modulating the composite electronic signal including the plurality of modulation frequencies. However, Adachi et al teaches symbol wave shaping and IQ modulating said composite electronic signal including the plurality of modulation frequencies. (i.e., Figure 9, col. 12, lines 54-67 and col. 13, lines 1-40). Based on this teaching, it would have been obvious to one having skill in the art at the time the invention was

Art Unit: 2613

made to incorporate the symbol wave shaping and IQ modulating said composite electronic signal including the plurality of modulation frequencies as taught by Adachi et al in the system of the combination of Tiemann et al and Wickham et al. One of ordinary skill in the art would have been motivated to do this since allowing increasing the capacity of system.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lee et al (US Patent No. 7,349,633) discloses optical wireless communication system.

Seto et al (US Patent No. 7,043,271) discloses radio communication system.

Starup (US Patent No. 6,137,612) discloses method and system for channelization.

Volkening (US Patent No. 7,245,833) discloses photonic channelized RF receiver.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanh Phan whose telephone number is (571)272-3035.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye, can be reached on (571)272-3078. The fax phone

Art Unit: 2613

number for the organization where this application or proceeding is assigned is (571)273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4700.

/Hanh Phan/

Primary Examiner, Art Unit 2613